

CLAIMS

- 1 1. A perpendicular magnetic head, comprising:
2 a first magnetic pole having a portion thereof that is exposed at an air bearing surface
3 (ABS) of the magnetic head;
4 a second magnetic pole including a pole tip thereof that is exposed at said ABS;
5 a heating element being disposed between said first magnetic pole and said pole tip;
6 an induction coil layer that is disposed between said first magnetic pole and said second
7 magnetic pole.
- 1 2. A perpendicular magnetic head as described in claim 1 wherein said heating element is
2 disposed between said induction coil and said pole tip.
- 1 3. A perpendicular magnetic head as described in claim 1 wherein said second magnetic
2 pole includes a shaping layer that is disposed in magnetic flux communication with said first
3 magnetic pole, and a probe layer which includes said pole tip, wherein said probe layer is
4 disposed in magnetic flux communication with said shaping layer.
- 1 4. A perpendicular magnetic head as described in claim 3 wherein said shaping layer is
2 disposed between said heating element and said pole tip.
- 1 5. A perpendicular magnetic head as described in claim 3 wherein said probe layer is
2 disposed between said heating element and said shaping layer.

1 6. A perpendicular magnetic head, comprising:
2 a read head element;
3 a first magnetic pole having a pole tip portion thereof that is exposed at an air bearing
4 surface (ABS) of the magnetic head;
5 a second magnetic pole including a portion thereof that is exposed at said ABS;
6 a heating element being disposed between said read head element and said pole tip; and
7 an induction coil layer that is disposed between said first magnetic pole and said second
8 magnetic pole.

1 7. A perpendicular magnetic head as described in claim 6 wherein said first magnetic pole
2 includes a shaping layer that is disposed in magnetic flux communication with said second
3 magnetic pole, and a probe layer which includes said pole tip, wherein said probe layer is
4 disposed in magnetic flux communication with said shaping layer.

1 8. A perpendicular magnetic head as described in claim 7 wherein said shaping layer is
2 disposed between said heating element and said pole tip.

1 9. A hard disk drive including a perpendicular magnetic head, comprising:
2 a media disk being adapted for rotation in a first direction;
3 said magnetic head including:
4 a write head element including a magnetic pole having a pole tip portion thereof that is
5 exposed at an air bearing surface (ABS) of the magnetic head, and disposed to write magnetic
6 bits to portions of said media disk;

7 a heating element being disposed proximate said pole tip, such that said heating element
8 is disposed to heat said portions of said magnetic disk prior to the writing of said magnetic bits to
9 said portions of said media disk.

1 10. A hard disk drive as described in claim 9, wherein said magnetic head includes a second
2 magnetic pole having a portion thereof that is exposed at said ABS;

3 an induction coil that is disposed between said first magnetic pole and said second
4 magnetic pole, and

5 wherein said heating element is disposed between said induction coil and said pole tip.

1 11. A hard disk drive as described in claim 10 wherein said second magnetic pole includes a
2 shaping layer that is disposed in magnetic flux communication with said first magnetic pole, and
3 a probe layer which includes said pole tip, wherein said probe layer is disposed in magnetic flux
4 communication with said shaping layer.

1 12. A hard disk drive as described in claim 11 wherein said shaping layer is disposed
2 between said heating element and said pole tip.

1 13. A hard disk drive as described in claim 11 wherein said probe layer is disposed between
2 said heating element and said shaping layer.

1 14. A hard disk drive as described in claim 10 wherein said first magnetic pole includes a
2 shaping layer that is disposed in magnetic flux communication with said second magnetic pole,

3 and a probe layer which includes said pole tip, wherein said probe layer is disposed in magnetic
4 flux communication with said shaping layer.

1 15. A hard disk drive as described in claim 14 wherein said shaping layer is disposed
2 between said heating element and said pole tip.

1 16. A method for fabricating a perpendicular magnetic head, comprising:
2 fabricating a first magnetic pole upon a layer of the magnetic head, wherein a portion of
3 said first magnetic pole is exposed at an air bearing surface (ABS) of said magnetic head;
4 fabricating a second magnetic pole in magnetic flux communication with said first
5 magnetic pole such that a pole tip portion of said second magnetic pole is exposed at said ABS;
6 fabricating an induction coil between said first magnetic pole and said second magnetic
7 pole;
8 fabricating a heating element within said magnetic head prior to fabrication of said
9 second magnetic pole.

1 17. A method for fabricating a perpendicular magnetic head as described in claim 16,
2 wherein said step of fabricating said second magnetic pole includes the steps of fabricating a
3 probe layer that includes said pole tip, and fabricating a shaping layer portion of said second
4 magnetic pole upon said probe layer, wherein said shaping layer is formed in magnetic flux
5 communication with said first magnetic pole.

1 18. A method for fabricating a perpendicular magnetic head as described in claim 16,
2 wherein said step of fabricating said second magnetic pole includes the steps of:

3 fabricating a shaping layer portion of said second magnetic pole and wherein said
4 shaping layer is formed in magnetic flux communication with said first magnetic pole, and
5 forming a probe layer upon said shaping layer in magnetic flux communication therewith,
6 and wherein said pole tip is formed as a part of said probe layer.

1 19. A method for fabricating a perpendicular magnetic head, comprising:

2 fabricating a first magnetic pole upon a layer of the magnetic head, wherein a pole tip
3 portion of said first magnetic pole is exposed at an air bearing surface (ABS) of said magnetic
4 head;

5 fabricating a second magnetic pole in magnetic flux communication with said first
6 magnetic pole such that a portion of said second magnetic pole is exposed at said ABS;

7 fabricating an induction coil between said first magnetic pole and said second magnetic
8 pole;

9 fabricating a heating element within said magnetic head prior to fabrication of said first
10 magnetic pole.

1 20. A method for fabricating a perpendicular magnetic head as described in claim 19,
2 wherein said step of fabricating said first magnetic pole includes the steps of fabricating a probe
3 layer that includes said pole tip subsequent to fabricating said heating element, and fabricating a
4 shaping layer portion of said first magnetic pole upon said probe layer.

1 21. A method for fabricating a perpendicular magnetic head as described in claim 19,
2 wherein said step of fabricating said first magnetic pole includes the steps of:

3 fabricating a shaping layer portion of said first magnetic pole and wherein said shaping
4 layer is formed in magnetic flux communication with said second magnetic pole, and
5 forming a probe layer upon said shaping layer in magnetic flux communication therewith,
6 and wherein said pole tip is formed as a part of said probe layer.